CLAIMS

1. A method for producing an alcohol and/or a ketone from at least one corresponding alkene by bringing a starting material containing the alkene(s), as a gas phase into contact with an oxide catalyst in the presence of water vapor to carry out the reaction, wherein

said oxide catalyst satisfies the following requirements:

(a) it comprises an oxide(s) of molybdenum and/or tin, and

(b) the amount of carbonaceous substances accumulated on said oxide catalyst is controlled to be within a range of 0.1 to 10% by mass, during said reaction.

2. A method according to claim 1, which comprises recovering the unreacted alkene(s) and the alcohol and/or ketone from a reaction mixture obtained by said reaction, and recycling the unreacted alkene(s) as a portion of the starting material.

3. A method according to claim 1 or 2, wherein in carrying out said reaction by a fluidized bed reaction system, a catalyst recycling system is adopted which comprises taking out the oxide catalyst used in the reaction from a reactor, regenerating said oxide catalyst in the presence of an oxygen-containing gas, and returning the regenerated oxide catalyst to the reactor.

4. A method according to claim 3, wherein the amount of carbonaceous substances accumulated on the oxide catalyst to be returned to the reactor is controlled to be within a range of 0.1 to 10% by mass.

5. A method according to claim 3 or 4, wherein the temperature at the regeneration of the oxide catalyst in the presence of the oxygen-containing gas is 270 to 550°C.

6. A method according to any one of claims 3 to 5, wherein the mass ratio of the amount of the oxide catalyst returned to the reactor to the amount of the alkene(s) fed to the reactor ranges from 0.5 to 100.

7. A method according to any one of claims 1 to 6, wherein the amount of carbonaceous substances accumulated on the oxide catalyst is controlled to be within a range of 0.3 to 5% by mass.

8. A method according to any one of claims 1 to 7, wherein the atomic ratio X of molybdenum to the sum of tin and molybdenum in the oxide catalyst {Mo/(Sn + Mo); wherein Mo is the number of atoms of molybdenum in said oxide catalyst, and Sn is the number of atoms of tin in said oxide catalyst} is in a range excluding 0.29 and 0.51.

9. A method according to any one of claims 1 to 7, wherein the atomic ratio X of molybdenum to the sum of tin and molybdenum in the oxide catalyst {Mo/(Sn + Mo); wherein Mo is the number of atoms of molybdenum in said oxide catalyst, and Sn is the number of atoms of

tin in said oxide catalyst} is in a range of $0 \leq X < 0.50$ (excluding 0.29).

10. A method according to any one of claims 1 to 7, wherein the atomic ratio X of molybdenum to the sum of tin and molybdenum in the oxide catalyst {Mo/(Sn + Mo); wherein Mo is the number of atoms of molybdenum in said oxide catalyst, and Sn is the number of atoms of tin in said oxide catalyst} is in a range of $0.01 \leq X \leq 0.24$.

11. A method according to any one of claims 1 to 10, wherein the molar ratio of the amount of oxygen gas fed to the reactor to the amount of the alkene(s) fed to the reactor ranges from 0.0 to 0.5.

12. A method according to any one of claims 1 to 11, wherein the molar ratio of the amount of water vapor fed to the reactor to the amount of the alkene(s) fed to the reactor ranges from 0.05 to 10.0.

13. A method according to any one of claims 1 to 12, wherein the whole or a portion of recovered water after said reaction is reused in said reaction.

14. A method according to any one of claims 1 to 13, wherein the alkene(s) is 1-butene and/or 2-butene.

15. A method according to claim 14, wherein the starting material containing 1-butene and/or 2-butene as the alkene(s) contains at least one compound selected from the group consisting of isobutene, butadiene, tert-butyl alcohol and methyl tert-butyl ether.